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REMARKS

Claims 1-37 are pending. Claim 10 has been amended without change in scope to change "the transition region" to "a transition region" in one instance.

Prior Art Rejections

The claims all stand rejected as anticipated over three different references. The references are discussed in detail individually below. In brief, none of the applied references teach or suggest use of absorptive regions.

Chapman

Claims 1-37 stand rejected under 35 USC 102(e) as anticipated by Chapman et al., U.S. Patent No. 6,875,543 ("Chapman"). Withdrawal of the rejections is respectfully requested for at least the following reasons.

Chapman discloses a method for the implementation of phase shifting masks for EUV lithography. The method involves etching away some of the layers of a multilayer coating of the mask, thereby creating a phase shift region. Col. 2, lines 45-52.

Chapman does not disclose making a mask with absorptive regions, and does not disclose placement of absorptive regions adjacent to reflective and phase shift regions.

Claim 1 discloses a method of selectively exposing resist that includes use of a reticle with at least part of a first reflective region and at least part of a second reflective region on respective opposite sides of an absorptive region, wherein the first reflective region and the second reflective region reflect incident coherent light out of phase relative to one another. Chapman does not teach or suggest use of absorptive regions, let alone placing absorptive regions between a pair of reflective regions that reflect coherent light out of phase relative to one another. Therefore claims 1-8 are patentable over Chapman.

Claim 9 discloses a method of selectively exposing resist with radiation that

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includes using a reticle that has first and second reflective regions, and an absorptive region. Chapman does not teach or suggest use of an absorptive region, and thus Chapman does not teach or suggest all of the recited elements of claim 9. Therefore claims 9-16 are patentable over Chapman.

Claim 17 recites a method of fabricating a reticle that includes selectively removing at least some of the reflective layers from parts of the reticle, so as to form an absorptive region with substantially all of the reflective layers removed. Chapman does not teach or suggest removing substantially all of the reflective layers to form an absorptive region on a reticle. Chapman does not teach or suggest removing substantially all of the reflective layers from a portion of a reticle. Chapman discusses precise controlling of the reactive ion etching to prevent too many of the reflective material layers from being etched away, col. 3, lines 35-47, and avoiding reduction in reflectivity, col. 3, lines 48-53, but does not disclose formation of an absorptive region. To the contrary, Chapman's warnings against reduction in reflectivity teach away from formation of an absorptive region. Thus claims 17-23 are patentable over Chapman.

Claim 24 recites a reflective reticle with reflective regions that reflect incident coherent radiation out of phase with one another, on respective opposite sides of an absorptive region. As discussed above with regard to claim 1, Chapman does not teach or suggest such a reticle. Therefore claims 24-30 are patentable over Chapman.

Claim 31 recites a reflective reticle that includes reflective regions that reflect incident coherent radiation out of phase with one another, and an absorptive region. As discussed above with regard to claim 9, Chapman does not teach or suggest such a reticle, and thus claims 31-37 are patentable over Chapman.

In addition, Chapman does not teach or suggest features recited in some of the dependent claims, such as having an absorptive region being an exposed part of a substrate (claims 7, 15, 30, and 37), having the reflective layers include boron carbide (claims 13, 23, and 35), and having a substrate that is a low thermal expansion material

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(claims 14 and 36).

LaFontaine

Claims 1-37 stand rejected under 35 USC 102(e) as anticipated by LaFontaine et al., U.S. Patent No. 6,645,679 ("LaFontaine"). Withdrawal of the rejections is respectfully requested for at least the following reasons.

La Fontaine discloses an attenuated phase shift mask utilizing a multilayer structure, in which a portion of the structure is locally modified by heat treatment or e-beam treatment to provide different reflective characteristics. The local heating may provide a phase shift in the reflectance of portions of the phase shift mask by producing a depression in the multilayer and a change in the period of the multilayer. LaFontaine does not disclose use of absorptive regions of in its multilayer structure. Nor does LaFontaine disclose removal of reflective layers of the multilayer structure.

Claim 1 discloses a method of selectively exposing resist that includes use of a reticle with at least part of a first reflective region and at least part of a second reflective region on respective opposite sides of an absorptive region, wherein the first reflective region and the second reflective region reflect incident coherent light out of phase relative to one another. LaFontaine does not teach use of absorptive regions placed between a pair of reflective regions that reflect coherent light out of phase relative to one another. Therefore claims 1-8 are patentable over LaFontaine.¹

Claim 9 discloses a method of selectively exposing resist with radiation that includes using a reticle that has first and second reflective regions, wherein the reflector has more of the reflective layers in one of the reflective regions than in the other of the

¹ At the time the claimed invention was made, the invention and LaFontaine were owned by, or subject to an obligation of assignment to, the same person. Thus under 35 USC 103(c) LaFontaine is not prior art for purposes of an obviousness rejection, and any question of whether LaFontaine suggests the claimed invention is of no consequence.

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reflective regions. LaFontaine does not teach use of use of more reflective layers in one reflective region than another, but rather involves making a depression in a stack of reflective layers. Thus LaFontaine does not teach all of the recited elements of claim 9, and claims 9-16 are patentable over LaFontaine.

Claim 17 recites a method of fabricating a reticle that includes selectively removing at least some of the reflective layers from parts of the reticle, so as to form an absorptive region with substantially all of the reflective layers removed. LaFontaine does not teach removal of reflective layers. Thus claims 17-23 are patentable over LaFontaine.

Claim 24 recites a reflective reticle with reflective regions that reflect incident coherent radiation out of phase with one another, on respective opposite sides of an absorptive region. As discussed above with regard to claim 1, LaFontaine does not teach such a reticle. Therefore claims 24-30 are patentable over LaFontaine.

Claim 31 recites a reflective reticle that includes a pair of reflective regions that reflect incident coherent radiation out of phase with one another, wherein the reflector has more of the reflective layers in one of the reflective regions than in the other of the reflective regions. As discussed above with regard to claim 9, LaFontaine does not teach such a reticle, and thus claims 31-37 are patentable over LaFontaine.

Yan

Claims 1-37 stand rejected under 35 USC 102(e) as anticipated by Yan, U.S. Patent No. 6,562,522 ("Yan"). Withdrawal of the rejections is respectfully requested for at least the following reasons.

Yan discloses an attenuated phase-shifting photomask that includes a multilayer substrate 200, that is topped by a pair of thin film layers 202 and 204. The layers 202 and 204 are selectively removed from parts of the structure by etching. In regions 206 where the layers 202 and 204 remain, there is attenuation and a phase shift, relative to

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a region 208 where the layers 202 and 204 have been removed. Yan does not disclose use of absorptive regions in its phase shift mask, nor does Yan disclose removing substantially all of a stack of layers.

Claim 1 discloses a method of selectively exposing resist that includes use of a reticle with at least part of a first reflective region and at least part of a second reflective region on respective opposite sides of an absorptive region, wherein the first reflective region and the second reflective region reflect incident coherent light out of phase relative to one another. Yan does not teach or suggest use of absorptive regions, let alone placing absorptive regions between a pair of reflective regions that reflect coherent light out of phase relative to one another. Therefore claims 1-8 are patentable over Chapman.

Claim 9 discloses a method of selectively exposing resist with radiation that includes using a reticle that has first and second reflective regions, and an absorptive region. Yan does not teach or suggest use of an absorptive region, and thus Yan does not teach or suggest all of the recited elements of claim 9. Therefore claims 9-16 are patentable over Yan.

Claim 17 recites a method of fabricating a reticle that includes selectively removing at least some of the reflective layers from parts of the reticle, so as to form an absorptive region with substantially all of the reflective layers removed. Yan does not teach or suggest removing substantially all of the reflective layers to form an absorptive region on a reticle. Thus claims 17-23 are patentable over Yan.

Claim 24 recites a reflective reticle with reflective regions that reflect incident coherent radiation out of phase with one another, on respective opposite sides of an absorptive region. As discussed above with regard to claim 1, Yan does not teach or suggest such a reticle. Therefore claims 24-30 are patentable over Yan.

Claim 31 recites a reflective reticle that includes reflective regions that reflect incident coherent radiation out of phase with one another, and an absorptive region. As

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discussed above with regard to claim 9, Yan does not teach or suggest such a reticle, and thus claims 31-37 are patentable over Yan.

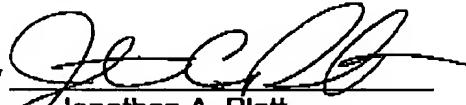
In addition, Yan does not teach or suggest features recited in some of the dependent claims, such as having an absorptive region being an exposed part of a substrate (claims 7, 15, 30, and 37), having the reflective layers include boron carbide (claims 13, 23, and 35), and having a substrate that is a low thermal expansion material (claims 14 and 36).

Conclusion

For at least the foregoing reasons, withdrawal of the rejections of the claims is respectfully requested, in which event this application would be in condition for allowance. Should the Examiner believe that a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact Applicant's undersigned attorney at the telephone number listed below.

No fee is believed to be due with the filing of this paper. In the event any fees are due in connection with the filing of this paper, the Commissioner is authorized to charge those fees to Deposit Account No. 18-0988 (Charge No. AMDSPH1567US).

Respectfully submitted,
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